Bennelongia
Environmental Consultants

Round Hill Iron Ore Project:

Troglofauna Survey

Prepared for:

HanRoy

June 2025

Draft Report

Short-Range Endemics | Subterranean Fauna

Waterbirds | Wetlands

Round Hill Iron Ore Project: Troglofauna Survey

Bennelongia Pty Ltd
5 Bishop Street
Jolimont WA 6014

P: (08) 9285 8722
F: (08) 9285 8811
E: info@bennelongia.com.au

ABN: 55 124 110 167

Report Number: 719

Report Version	Prepared by	Reviewed by	Submitted to Client	
			Method	Date
Draft	Ethan Lamont	Danilo Harms	email	12 June 2025
Final	Ethan Lamont		email	28 July 2025

K:\Projects\B_HAN_27\8_Report\Draft

EXECUTIVE SUMMARY

HanRoy, on behalf of Hancock Prospecting Pty Ltd, is undertaking a concept study for the proposed development of the Round Hill Iron Ore Project (the Project) to determine options for mines and supporting infrastructure. Round Hill is situated approximately 40 km west of Newman and 110 km south-west of HanRoy's Roy Hill Iron Ore Mine in the Gascoyne bioregion of the eastern Pilbara (Figure 1). The key component of the Project is the mining of iron ore through a series of open, above water mine pits. The proposal consists of two open-mine pits, a bore field north of the eastern pit to accommodate requirement for water for processing, and the supporting infrastructure.

Subterranean fauna can be a key factor in the assessment of projects by the Environmental Protection Authority (EPA). HanRoy has contracted Bennelongia Environmental Consultants to undertake an assessment of subterranean fauna in the Project and surrounding area to determine whether any species are likely to be impacted by the proposed development, following the relevant EPA guidelines for subterranean fauna study. This assessment comprised a desktop review of subterranean fauna and three rounds of field survey.

The desktop review of the geological values showed that prospectivity of troglofauna in the survey area is high, with favourable geologies in the unmineralized BIF, and sheetwash plain providing prospective and fractured habitat. Deep depth to the water table, >30m, also provides considerable area of possible habitat for troglofauna, increasing the likelihood of abundant and diverse troglofaunal communities. The prospect of stygofauna occurrence is also high but this fauna will be addressed in a separate report.

Three rounds of survey targeting troglofaunal were conducted in the Project area from 5th of February 2024 to the 17th of January 2025 (specifics on survey timing and effort can be found in section 4.1.1). During the survey 104 sites were sampled, with 103 scrapes and 170 traps being collected. Some stygofauna sampling was undertaken at the same time as troglofauna sampling and the subterranean species collected as bycatch from this program were included in the results section of this report.

A total of 28 troglofauna species were collected during the sampling program, with eight species currently known only from the survey area, and three of these species known only from within the proposed area of impact. These three species (the centipede *Cryptops* 'BSCOL147' and the pauropods Pauropodidae 'BPU127' and `BPU128') are know from single species and drill holes, suggesting problems with sampling these species rather than true range restriction in the otherwise interconnected geologies that extend well beyond the area of proposed impact.

Available information on species ranges, the geological profile of the Project area, the proximity to the border of the impact area, and the small area of impact, altogether suggest that the three species presently known only from the Project area are likely to have ranges extending beyond the impact area, and into local or regional areas surrounding the mine pits. As such, the impact of Project development on subterranean fauna conservation values is considered to be low.

CONTENTS

Executive Summary iii
1. Introduction 1
2. Troglofauna Framework 1
2.1. Prospective Habitat 1
2.2. Legislation 3
3. Project Setting 3
3.1. Geology 3
3.2. Suitability for Troglofauna 3
4. Survey Methods 7
4.1.1. Survey Timing and Effort 7
4.1.2. Field Sampling Methods 7
4.1.3. Troglofauna trapping 9
4.1.4. Laboratory Sorting and Morphological Identification 9
4.1.5. DNA Sequencing 9
4.1.6. Survey Limitations 10
5. Results 10
5.1.1. Species Ranges 12
6. Summary 13
7. References 14
Appendix 1: Troglofauna Species Collected in the Survey 16
Appendix 2: Drill Holes Sampled for Troglofauna 20
Appendix 3: Results of molecular analyses for troglofauna collected in the project area 32

LIST OF FIGURES

Figure 1. Location of the Round Hill Iron Ore Project 2
Figure 2. Bedrock Geology in and Around the Project Area 4
Figure 3. Surface Geology in and Around the Project Area 5
Figure 4. Round Hill Proposed Bore Field Hydrogeological Schematic Cross-Section (Provided by HanRoy) 6
Figure 5. Sites Sampled for Troglofauna Each Round 8

LIST OF TABLES

Table 1. Troglofauna Survey Timing. 7
Table 2. Troglofauna Survey Effort. 7
Table 3. Troglofauna species collected during field survey. 10

1. INTRODUCTION

HanRoy, on behalf of Hancock Prospecting Pty Ltd, is undertaking an Order of Magnitude study for the proposed development of the Round Hill Iron Ore Project (the Project) to determine options for mines and supporting infrastructure. Round Hill is situated approximately 40 km west of Newman and 110 km south-west of HanRoy's Roy Hill Iron Ore Mine in the Gascoyne bioregion of the eastern Pilbara (Figure 1). The key component of the Project is the mining of iron ore through a series of open, above water mine pits. The proposal consists of two open-mine pits, a bore field north of the eastern pit to accommodate requirement for water for processing, and the associated supporting infrastructure.

HanRoy has contracted Bennelongia Environmental Consultants to undertake an assessment of the subterranean fauna occurrence at the Project and surrounding area to determine whether any species identified are likely to be impacted by the proposed development, according to the relevant EPA guidelines for subterranean fauna (EPA 2016, 2021).

2. TROGLOFAUNA FRAMEWORK

The term "subterranean fauna" encompasses two distinct animal communities: the air-breathing troglofauna that exists in the vadose zone between the surface and the water table; and the aquatic stygofauna that live within groundwater habitats. Despite both land clearing and groundwater drawdown threatening both troglofauna and stygofauna, this report will focus solely on the impact on troglofauna communities, with stygofauna to be discussed in a separate report.

Due to relatively uniform selection pressures in underground habitats, subterranean fauna typically exhibits many convergent morphological and physiological characteristics, such as reduced or absent eyes, loss of body pigmentation, loss of wings, elongate sensory structures, a shift towards K-selected breeding strategies and decreased rates of metabolism (Gibert and Deharveng 2002). The overwhelming majority of subterranean species in Western Australia are invertebrates but at least two fishes and one snake have also been found. Troglofauna species for which their entire lifecycle occurs below ground are classed as troglobites, while troglofauna species that either have some aboveground populations, or for which individuals may visit the surface for biological functions such as reproduction, are classed as troglophiles. Surface occurrence of these troglophiles gives these species much greater opportunity for population dispersal, and therefore a larger expected range than troglobitic species that are often confined to a single geology or aquifer.

Subterranean fauna species contribute markedly to the overall biodiversity of Australia. The Pilbara and Yilgarn regions of Western Australia in particular are recognised as places of globally significant subterranean fauna populations, with an estimated 4,500 or more subterranean species likely to occur in these regions (Guzik et al. 2010; Halse 2018), the majority of which are undescribed. Many troglofauna species are short range endemics (SREs), with much smaller ranges than Harvey's SRE range criterion of 10,000 km^2 (Harvey 2002). Given that species with small ranges are more vulnerable to extinction following habitat degradation than wider ranging species (Ponder and Colgan 2002), it follows that subterranean taxa are highly susceptible to anthropogenic threats, particularly excavation involved in open-pit mining.

2.1. Prospective Habitat

Troglofauna have been found to occur widely in mineralised iron formations, calcretes and alluvial-detrital deposits in the Pilbara (Halse 2018). Troglofauna surveys in Western Australia outside the Pilbara have been limited but surveys in ironstone ranges in the Yilgarn at Koolyanobbing, Mt Jackson and Mt Dimmer have yielded depauperate to moderately rich troglofauna communities (Bennelongia 2008a, b), while significant communities have been recorded in calcretes of the Yilgarn region. Records of the occurrence of troglofauna in more coastal areas of south-western Australia are few and mostly from limestone caves (e.g. Knott et al. 2009; Moulds 2007; Tang and Knott 2009). Vertical connectivity of

GCS GDA 1994
Author: elamont
Date: 29/07/2024

Legend

- Newman
- Round Hill
- Roy Hill

Figure 1. Location of the Round Hill Iron Ore Project

habitat plays an important role in facilitating the transport of carbon and nutrients from the surface to maintain subterranean fauna populations, while lateral connectivity of habitat and the network of cracks, fissures and voids is crucial to underground population dispersal (Bennelongia 2015). Depth to water table also affects the occurrence of troglofauna species, with communities being unlikely to be well developed unless groundwater levels are >10 metres below ground level (mbgl) (except possibly in areas of outcropping calcrete).

2.2. Legislation

Native flora and fauna in Western Australia are protected at both State and Commonwealth levels. At the state level, the Biodiversity Conservation Act 2016 (BC Act) provides a legal framework for protection of species, particularly for species listed by the Minister for the Environment as threatened. At a national level, the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) also protects species listed as threatened. However, the threatened fauna list of the EPBC Act currently does not include inland subterranean fauna. In addition to the formal list of threatened species in Western Australia under the BC Act, the Department of Biodiversity, Conservation and Attractions (DBCA) maintains a list of priority fauna species that are of conservation importance but, for various reasons, do not meet the criteria for listing as threatened. Both the EPBC and BC Acts provide frameworks for the protection of threatened ecological communities (TECs). Within Western Australia, DBCA also informally recognises communities of potential conservation concern, but for which there is little information, as priority ecological communities (PECs). The list of subterranean fauna-based PECs is relatively large.

3. PROJECT SETTING

The Round Hill Project is located in the Hamersley Basin, within the archaean Pilbara Craton, which characteristically has a surface geology dominated by banded iron formation (BIF) sedimentary rocks interlaced with intrusions of chert, dolomite, siltstone shales, and a mixture of colluvial and alluvium Cainozoic deposits (McKenzie *et al*. 2009).

3.1. Geology

The local stratigraphy of the Project area and direct surrounds is dominated by the Dales Gorge Member of the Brockman Iron Formation and comprises predominant macro-banding of BIF and shale, with additional meso-and micro-banding of iron rich and chert rich layers (Trendal 1965; Martin 2021). All bedrock geology of the Project area belongs to the Brockman Iron Formation, which consists of metamorphosed BIF, chert, mudstone and siltstone combinations (Figure 2). Bedrock surrounding the project area includes the older Mount McRae Shale Formation and Wittenoom Formation directly to the north, consisting of mudstone, siltstone, and banded iron formation, and the younger Weeli Wolli Formation to the south and east, which is another BIF with additional mudstone, siltstone and dolerite sills (Figure 2). Overlaying the Brockman Formation (Hb) of the Project is a valley-filled deposit of partly consolidated colluvium (Czc), and extensive areas of sheetwash plain that contain combinations of colluvium and alluvium (Qw) (Tyler 1994; Figures 3, 4). Depth to groundwater in the Project area is 35 to 45m deep.

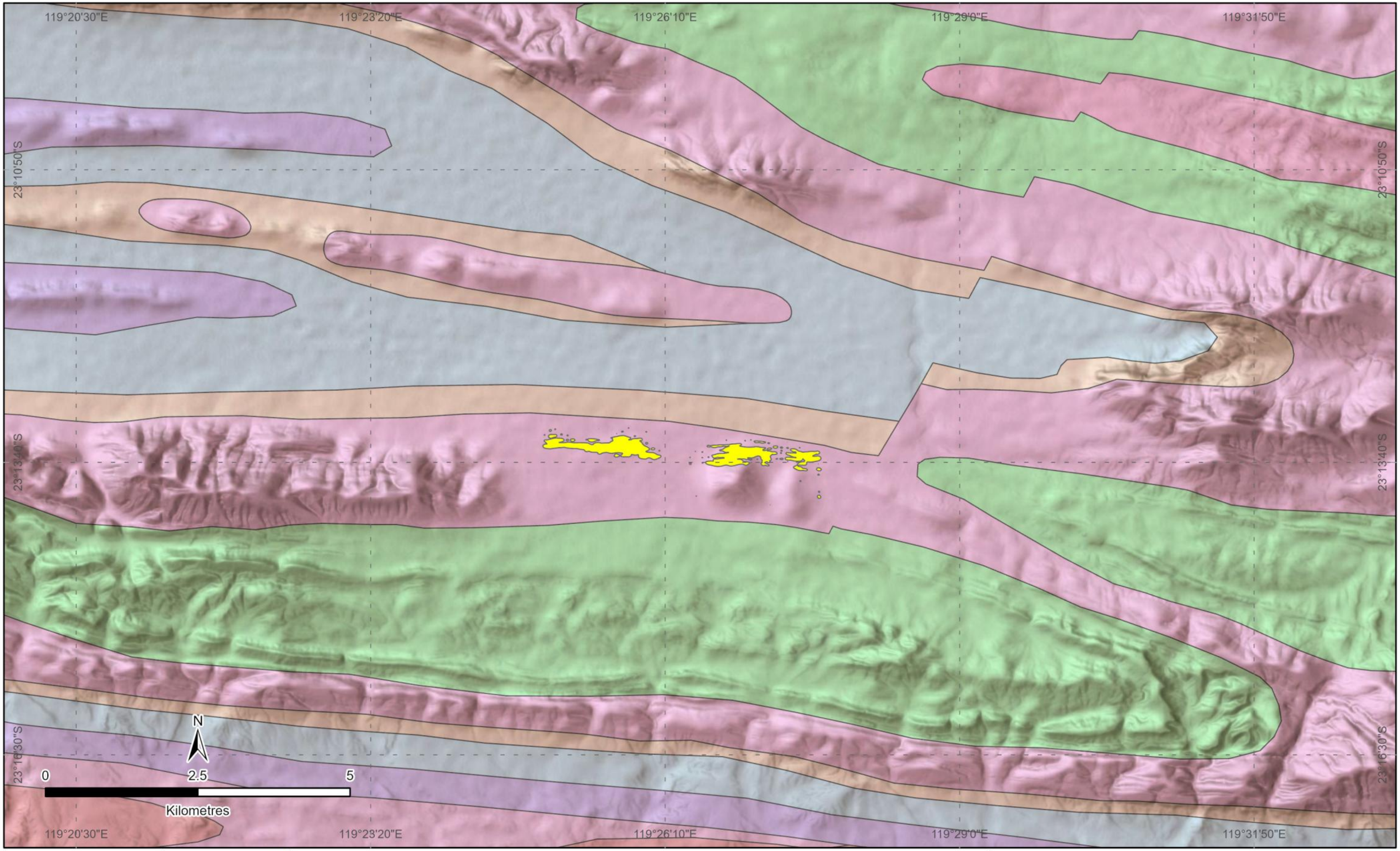
3.2. Suitability for Troglofauna

The potentially prospective habitats for troglofauna in the Project area are considered to be:

- Mineralised BIF – Considered **highly prospective** for troglofauna due to extensive voids and fissures in mineralised ore deposits (Bennelongia 2015).
- Sheetwash Plain - Considered **moderately prospective** for troglofauna based on considerable previous sampling outcomes and historical examples of troglofauna occurrence in colluvium and alluvium (Bennelongia, 2016; Edward and Harve, 2008).

Geologies in the project area that could act as barriers and confine subterranean fauna distributions, depending on position in landscape are considered to be:

- Unmineralised BIF – Considered **not prospective** for troglofauna due to impervious nature and lack of subterranean voids or spaces.

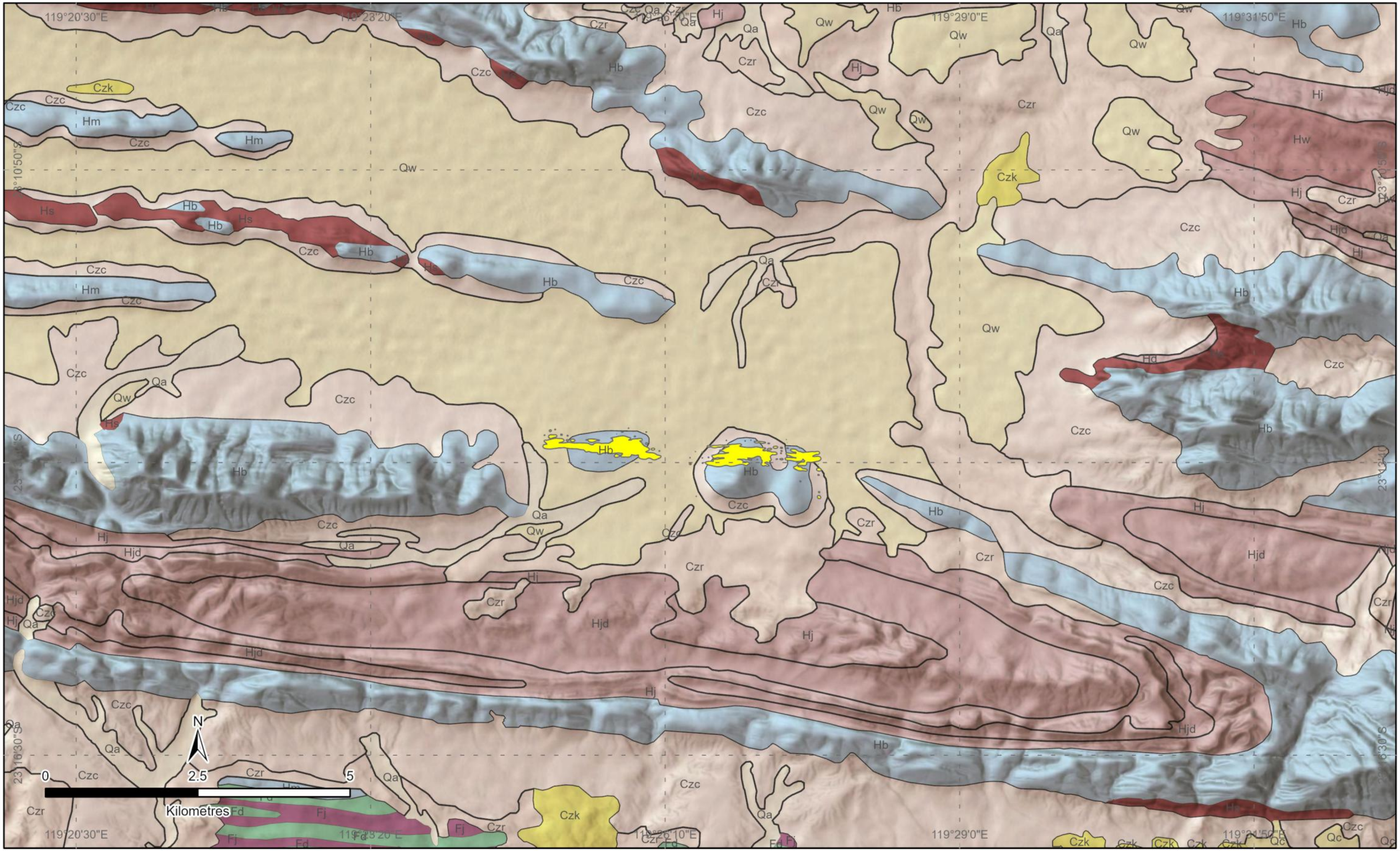


GCS GDA 1994
Author: elamont
Date: 8/08/2024

Legend

- Indicative Pit Shell
- Brockman Iron Formation
- Fortescue Group
- Jeerinah Formation
- Marra Mamba Iron Formation
- Mount McRae Shale and Mount Sylvia Formation
- Weeli Wolli Formation
- Wittenoom Formation
- Woongarra Rhyolite

Figure 2. Bedrock geology in and around the project area



Bennelongia Environmental Consultants

GCS GDA 1994
Author: elamont
Date: 8/08/2024

Legend

- Indicative Pit Shell
- Qa (Alluvium)
- Qw (Alluvium and colluvium)
- Qc (Colluvium)
- Czc (Colluvium)
- Czr (Laterite)
- Czk (Calcrete)
- Hw (Woongarra Volcanics)
- Hj (Weeli Wolli Formation)
- Hjd (Weeli Wolli Formation - Medium)
- Hb (Brockman Iron Formation)
- Hs (Mount McRae Shale)
- Hd (Wittendom Dolomite)
- Hm (Marra Mamba Iron Formation)
- Fd (Fortescue Group)
- Fj (Jeerinah Formation)

Figure 3. Surface geology in and around the project area

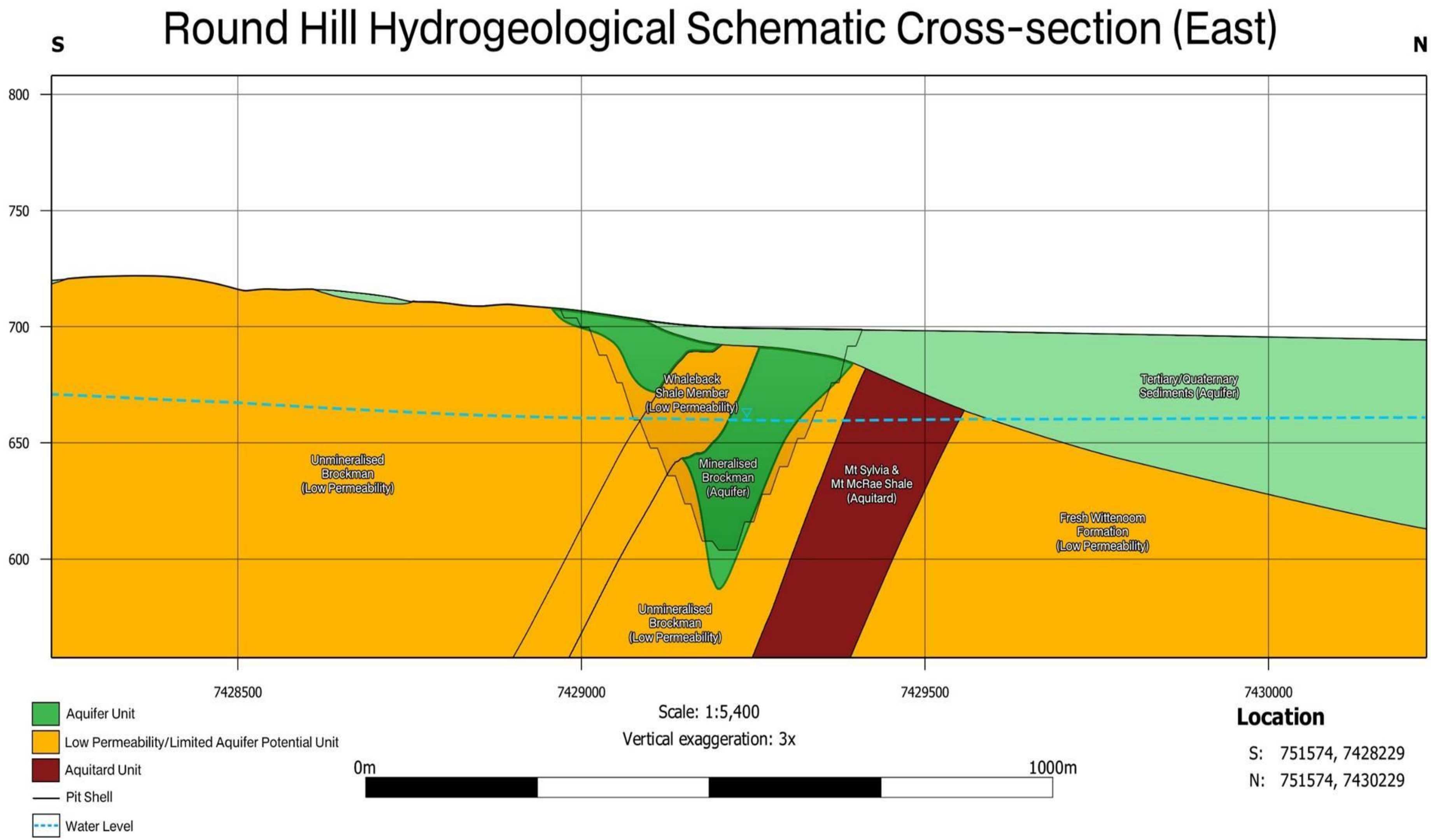


Figure 4. Round Hill Proposed Bore Field Hydrogeological Schematic Cross-Section (Provided by HanRoy)

- Whaleback Shale Member – Considered **not prospective** for troglofauna due to impervious nature and low permeability (Figure 4).

Overall, the prospectivity of troglofauna in the survey area is high, with favourable geologies in the unmineralized BIF, and sheetwash plain also providing prospective and fractured habitat. Deep depth to the water table, >30m, also provides considerable area of possible habitat, increasing the likelihood of abundant and diverse troglofaunal communities at the Project and its vicinity.

4. SURVEY METHODS

4.1.1. Survey Timing and Effort

A three-round survey for troglofauna was conducted at the Project area, with round one taking place between 5 February 2024 to 23 April 2024, round two taking place between 22 July 2024 to 25 September 2024, and the final round taking place between 28 October 2024 and 17 January 2025 (Table 1). The survey included both prospective pit and reference areas outside the pits. All sampling points were in the tenements of the Project area. During the first round, 29 scrape samples were collected, with 49 traps being set and collected from 29 drill holes. In round two, 39 scrapes were collected, while 68 traps were collected from 40 drill holes. During the final round, 35 scrapes were collected while 53 traps were collected from 35 drill holes. Overall, 104 holes were sampled for troglofauna, resulting in 103 scrapes, and 170 troglofauna traps set and collected within the survey area (Table 2, Figure 5). Of these, 56 samples were from within the proposed areas of impact and 48 samples were from reference areas outside the propose impact areas, bit within the Project area (Tables 1, 2). Note in this context that not all drill holes could be scraped and trapped for reasons of depth and access. However, considerable effort was made to retrieve both traps and scrape samples whenever possible to improve sampling accuracy. Details for all drill holes sampled are compiled in Appendix 2.

Table 1. Troglofauna Survey Timing.

Sampling phase	Troglofauna		
	Scrape, set traps	Retrieve traps	No of samples taken
1	05/02/2024 – 07/02/2024	22/04/2024 – 23/04/2024	78
2	22/07/2024 – 26/07/2024	24/09/2024 – 25/09/2024	107
3	28/10/2024 – 01/11/2024	16/01/2025 – 17/01/2025	88

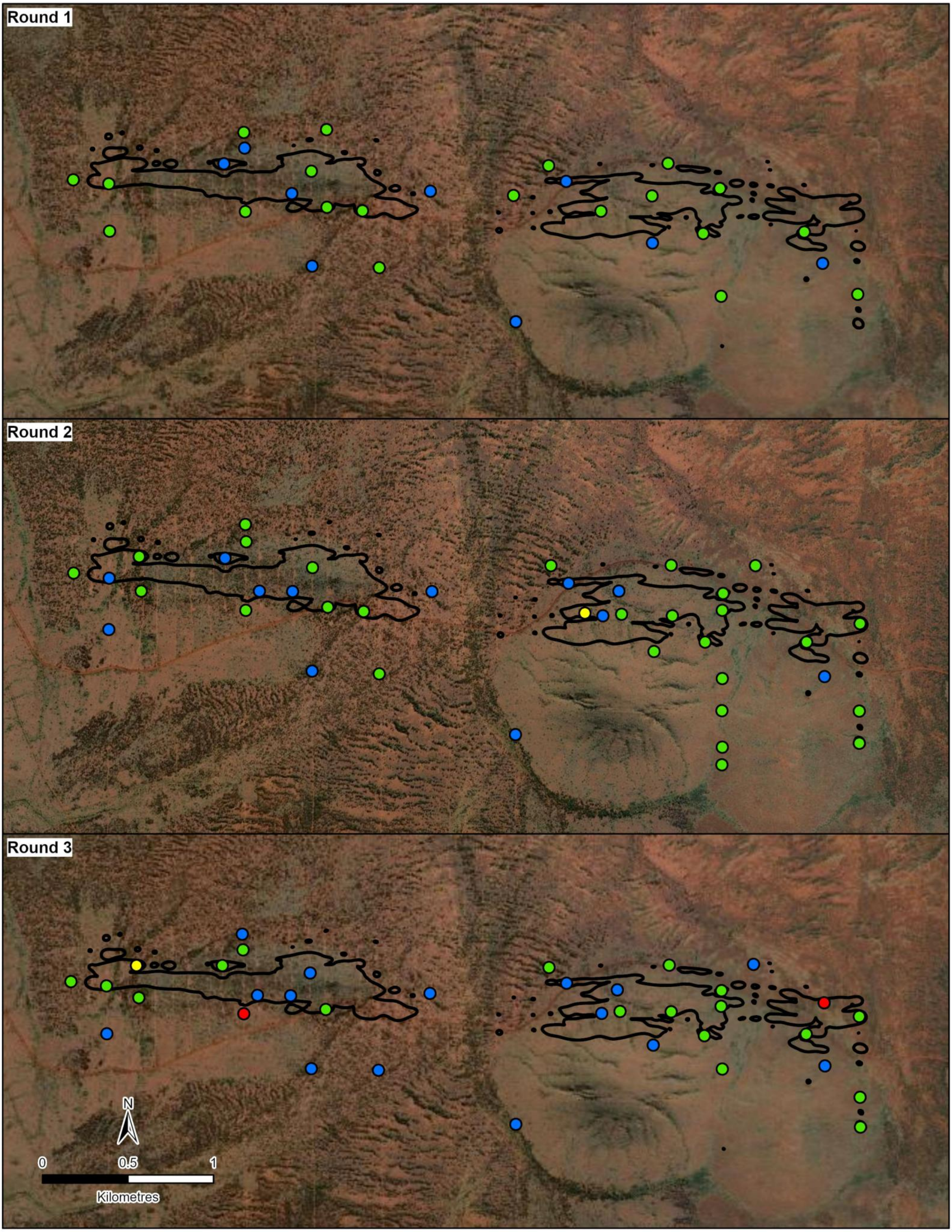
Table 2. Troglofauna Survey Effort.

Sampling period	Troglofauna sampling effort		Troglofauna sampling method			
	Impact	Reference	Scrape	Single trap	Double traps	Sites Sampled
1	14	15	29	9	20	29
2	21	19	39	12	28	40
3	21	14	35	15	19	35
Total	**56**	**48**	**103**	**36**	**67**	**104**

4.1.2. Field Sampling Methods

Sampling methods followed those outlined by the EPA (2016, 2021) and are described below.

Troglofauna scraping: Troglofauna was sampled in 150mm uncased drill holes. At each hole, a 90mm diameter net with 150 µm mesh was lowered to the base of the hole or just below the water table and hauled back to the surface along the wall of the hole. This was repeated 4-8 times depending on accessibility, changing the side of the hole being scraped, with the aim of scraping any troglofauna that



Bennelongia Environmental Consultants

GCS GDA 1994
Author: elamont
Date: 27/05/2025

Legend

- Indicative Pit Shell
- Scrape and Double Trap
- No Scrape and Double Trap
- Scrape Only
- Scrape and Single Trap

Figure 5. Sites Sampled for Troglofauna Each Round

were located on the walls into the net. The content of each haul was transferred into a larger net, flushed with bore water to reduce fine sediment content, and then deposited in a 125 ml polycarbonate vial. The vial was then filled with 100% ethanol and preserved on ice for further analyses in the lab, including molecular analyses. Nets were washed between holes with Decon-90 to minimise between-hole contamination.

4.1.3. Troglofauna trapping

After completing to scraping process, one or two cylindrical PVC traps, baited with moist leaf litter that had been sterilised via microwaving, were suspended at depth in each hole. If only one trap was placed, the trap would be placed within several metres above the watertable or the bottom of the hole, depending on accessibility and depth of each drill hole. If two traps were set, then the second would be placed halfway down the drill hole. The drill hole was sealed for the duration of the traps lifecycle to reduce contamination risk from terrestrial vertebrates and invertebrates. Traps remained for 8-9 weeks before being retrieved, and the leaf litter emptied into a zip-lock bag for extraction in the lab

4.1.4. Laboratory Sorting and Morphological Identification

In the laboratory, troglofauna scrapes were elutriated to separate out heavy sediment particles and sieved into size fractions using 250, 90 and 53 µm screens. Leaf Litter from troglofauna traps were loaded onto Tullgren funnels under halogen lamps and left over a 72-hour period to extract all animals. Heat and light from the lamps force troglofauna to move down through the litter into the base of the funnel, which contained a glass vial 100% ethanol as a preservative. This vial was emptied out regularly during the extraction proves, and invertebrates submitted to taxonomic identification.

Once prepared, all samples were observed and sorted under a dissecting microscope and specimens were identified to species where possible using available keys, species descriptions and, for undescribed species, characters in available taxonomic keys and descriptions. When necessary for identification, animals were dissected and examined under a differential interference contrast compound microscope. Undescribed species were assigned species codes (suffixed `B-`) to enable them to be tracked when compiling information on distributions in this and other surveys. All animals were databased in the Bennelongia database and reprehensive specimens will be lodged with the Western Australian Museum (WAM) upon completion of this Project.

4.1.5. DNA Sequencing

During the identification process, unidentifiable specimens (e.g. juvenile or damaged specimens) were flagged for DNA sequencing. A total of 19 specimens from the Project area were identified and sequenced, 17 of which yielded DNA sequence returns (two failures). A summary of the sequencing results is compiled in Appendix 3. Depending on the size of the specimens, legs or whole animals were used and micro-pestled for DNA extractions using a Qiagen DNeasy Blood and Tissue kit (Qiagen 2006), with final elute volumes of 100 µL. Two mitochondrial genes were targeted for polymerase chain reaction (PCR) amplification – the "barcoding" fragment if the mitochondrial cytochrome oxidase I (COI) gene using primer combination jgLCO1490:jgHCO2198 (Geller et al. 2013), and the mitochondrial ribosomal 16S gene using primer combination 16Sa:16Sb (Edgecombe et al. 2002). Next, dual-direction, Sanger sequencing was undertaken for PCR products by the Australian Genome Research Facility (AGRF), Perth node. Sequences returned were edited and aligned in Geneious Prime v2022.2.2 (https://www.geneious.com; Biomatters Ltd, New Zealand). Genetic distances to related sequences in the Bennelongia database were calculated as uncorrected p-distances (total percentage of nucleotide differences between sequences). Similarity to all sequences in the non-redundant nucleotide database at GenBank was determined using the Basic Local Alignment Search Tool nucleotide (BLAST) suite of applications (https://blast.ncbi.nlm.nih.gov/Blast.cgi) (Altschul et al. 1990). To visualise genetic distances and phylogenetic relationships between taxa, distance based phylogenetic trees were generated, also in Geneious v2022.2.2. Publicly available sequences on GenBank were included in phylogenetic analysis to provide a framework for assessing intra- versus interspecific variation and determining species boundaries. A full summary table of the genetic sequencing results can be found in Appendix 3.

4.1.6. Survey Limitations

Thirtynine (39) samples were excluded from DNA analysis. The samples may have been influenced by degradation due to exposure issues caused during a freighting delay, however none of these samples included specimens that required DNA analysis for identification or impact assessment purposes, and therefore this limitation had an insubstantial impact on the results and findings

5. RESULTS

The Project area was found to contain a moderately rich stygofauna community, with 198 specimens belonging to at least 28 morphospecies of troglofauna being collected within the surveyed area (see Appendix 1 for mapped species distributions). Troglofauna groups collected include earthworms (Oligochaeta), microwhip scorpions (Palpigradi), pseudoscorpions (Pseudoscorpiones), short-tailed whip-scorpions (Schizomida), centipedes (Chilopoda), millipedes (Diplopoda), pauropods (Pauropoda), symphylans (Symphyla), diplurans (Diplura), silverfish (Zygentoma), cockroaches (Blattodea), true bugs (Hemiptera), beetles (Coleoptera), and flies (Diptera). The survey also yielded some specimen fragments or juveniles (denoted as sp. indet.) that might belong to other species collected here (e.g. the schizomid *Draculoides* sp. indet and *Draculoides*`SCH055) might represent the same species. Following a precautionary approach, they are listed separately in Table 3.

The species list is collated from the specimens collected in troglofauna scrapes, traps, as well as the bycatch from stygofauna nets that were scraped along the side of uncased bores.

Table 3. Troglofauna species collected during field survey.
Occasionally identification is at higher level than species level but nevertheless all records represent occurrence of separate species.
Species highlighted ORANGE are unique to the survey but were collected outside areas of impact, while species highlighted YELLOW are currently only known from within the impact area

Higher Classification	Lowest ID	No of Records
Annelida		
Oligochaeta		
Enchytraeida		
Enchytraeidae	Enchytraeidae `2 bundle` s.l. (short sclero 2 per seg)	1
Arthropoda		
Arachnida		
Palpigradi	Palpigradi sp. indet	1
Pseudoscorpions		
Chthoniidae		
Tyrannochthonius	*Tyrannochthonius* `BPS604`	1
Schizomida		
Hubbardiidae		
Draculoides	*Draculoides* sp. indet (juvenile)	1
	Draculoides `SCH055`	6
Myriapoda		
Chilopoda		
Scolopendromorpha		
Cryptopidae		
Cryptops	*Cryptops* `BSCOL146`	1

Higher Classification	Lowest ID	No of Records
	Cryptops `BSCOL147`	1
Geophilomorpha		
Mecistocephalus	*Mecistocephalus* `BGE075`	1
Dipolpoda		
Polyxenida		
Lophoproctidae		
Lophoturus	*Lophoturus madecassus*	33
Pauropoda	Pauropoda sp. Biologic-PAUR085	1
Tetrameocerata		
Pauropodidae	Pauropodidae `BPU127`	1
	Pauropodidae `BPU128`	1
Decapauropus	*Decapauropus tenuis*	2
Symphyla		
Cephalostigmata		
Scutigerellidae		
Scutigerella	*Scutigerella* `BSYM142`	3
Hexapoda		
Diplura		
Japygidae	Japygidae sp. indet.	3
	Japygidae `BDP154` (DPL002)	1
	Japygidae `BDP246` (DBP165 grp)	3
Zygentoma		
Nicoletiidae		
Dodecastyla	*Dodecastyla* sp. indet	7
Trinemura	*Trinemura* sp. indet (juvenile)	2
	Trinemura `BZY120`	2
Blattodea		
Nocticolidae		
Nocticola	*Nocticola* sp. indet	10
	Nocticola quartermainei s.l.	4
Hemiptera		
Cixiidae	Cixiidae sp. B02	4
Meenoplidae	Meenoplidae sp. WAM-PHAC001/H-HEM003	6
Phaconeura	*Phaconeura* sp. indet	15
Coleoptera		
Carabidae		
Gregorydytes	*Gregorydytes ophthalmianus*	1
Carabidae		
Rodwayia	*Rodwayia* sp. indet	1
Diptera		
Sciaridae		
Allopnyxia	*Allopnyxia* sp. B01	5
TOTAL No.	28	198

5.1.1. Species Ranges

Of the 28 species collected, eight are known only from the survey area. These are: *Tyrannochthonius* \`BPS604\`, *Cryptops* \`BSCOL146\`, *Cryptops* \`BSCOL147\`, *Mecistocephalus* \`BGE075\`, Pauropodidae \`BPU127\`, Pauropodidae \`BPU128\`, *Scutigerella* \`BSYM142\`, *Trinemura* \`BZY120\`. Of these eight species, five have records collected outside the proposed area of impact from ground excavation, and therefore are expected to experience lower risk posed by mining operations. Three species are presently known only from proposed areas of impact and these are: the centipede *Cryptops* \`BSCOL147\` and the pauropds\`BPU127\` and \`BPU128. Of these species, the centipede species is known only from a single specimen and clearly data deficient, and the two pauropods are known only from a single drill hole, also illustrating problems in recovering the exact range of the species.

***Cryptops* \`BSCOL147\`:** This species is known from a single record collected in the eastern portion of the proposed pits, in bore HR0191, 15.79 m away from the edge of the impact area. *Crytops* species in the Pilbara have been observed to have variable distributions, with linear ranges of *Cryptops* species ranging between 2.9 km and 2225 km. Bennelongia (2022) reported that collection sites of *Cryptops* species in the Pilbara that are separated by about 5 km appear to mostly support different species, however, quite often these intervals include changes in geological profiles between records. The short distance from collection to the edge of the impact area is considerably lower than that of the lowest linear range of *Cryptops* species with >3 records. In addition to this, horizontally connected prospective geologies extend south outside the impact area, therefore it is expected that *Cryptops* \`BSCOL147\` will exist outside the area of impacts.

Pauropodidae \`BPU127\` and \`BPU128\`: Pauropod taxonomy in Australia is not well established (Scheller 2010, 2013) but variable range has been shown with many species (Halse and Pearson, 2014) and larger range species, such as the circumtropical *Decapauropus tenuis*, both present within the class. Pauropodidae \`BPU127\` is known from a single record within the impact area, collected from bore HR0002, 27.5m away from the impact area boundary, while Pauropodidae \`BPU128\` is also known from a single record within the impact area, but from bore HR0327, 10.8m away from the impact area boundary. The linear range of Pauropodidae species with >3 records within the Bennelongia database range between 6.9km and 979km showing large variability in species ranges. Genetic analysis was completed on both species, but neither analysis was matched with a previously sequenced species, therefore assigned species codes were maintained. We emphasize though that horizontally connected prospective geologies extend well outside the impact area, therefore it is expected that Pauropodidae \`BPU127\` and \`BPU128\` will both exist outside the area of drawdown impacts and remain undetected there. Note in this context that pauropods are very small and quite difficult to sample, hence the hypothesis of a data deficient, undersampled species is not unreasonable.

Please also note in the context of assessment that the impact area defined by the proposed pit boundaries has an area of 79.7 hectares, which is very small by development standards. Harvey et al (2008) defined one of the smallest known short range endemic subterranean species, *Draculoides mesozeirus* Harvey *et al*. 2008, inhabiting an area of approximately 100 hectares within Middle Robe, with subterranean species rarely being more restricted. Therefore the 79.7-hectare area of pit development is incredibly unlikely to restrict any species to impact, barring extreme geological uplift, erosion or fault fractures that would subsequently encourage speciation events (Harms et al. 2018). Since all troglofaunal species were collected in interconnected geologies that extend beyond the impact area, the threat to the species collected here is considered to be low and the three species known only from pit areas are assessed as data deficient, rather than endemic to a single site or drill hole.

6. SUMMARY

The desktop review suggested that the prospectivity for troglofauna in the local and regional area in and around the Project area is high, and also suggested that the project mine pit impact area supports a moderately rich stygofauna assemblage. The unmineralized BIF, and sheetwash plain provides prospective and fractured habitat, while the deep depth to the water table, >30m, also provides considerable area of possible habitat, increasing the likelihood of abundant and diverse troglofaunal communities. A field survey was therefore warranted to establish troglofaunal species occurrence and distributions at the Project and its vicinity.

A total of 28 species of troglofauna were collected from 273 samples, taken from 104 sites during three rounds of sampling, resulting in a relatively abundant, but only moderately diverse troglofauna community being present within the survey area. Genetic analysis was completed on 19 specimens, with 17 being successfully sequenced and assisting the assessment of species ranges.

Eight troglofaunal species collected were unique to this study, with three being restricted to the survey area, *Cryptops* `BSCOL147`, Pauropodidae `BPU127` and `BPU128`, all three of which are expected to have an extended linear range outside of areas of impact due to a combination of horizontally connected prospective geologies, small surface area of impact, and data deficiencies meaning that all three species were collected from a single drill hole or single specimens which is almost certainly reflecting the difficulties in sampling troglofauna at low abundances rather than real species distributions. In this interconnected geology. In summary, we suggest that the impact to troglofaunal values resulting from Project development is neglectable and economic development is unlikely to have a major impact on the fauna present.

The results of the stygofauna field survey will be reported in a separate document and complement the assessment for subterranean fauna conservation values.

7. REFERENCES

Altschul, S.F., Gish, W., Miller, W., Myers, E.W., and Lipman, D.J. (1990) Basic local alignment search tool. *Journal of Molecular Biology* 215, 403-410.

Bennelongia (2008a) Troglofauna survey at Koolyanobbing. Report 2008/49. Bennelongia Pty Ltd, Jolimont, WA, 24 pp.

Bennelongia (2008b) Troglofauna survey of Mount Jackson Range, Western Australia. Report 50., Bennelongia Pty Ltd, Jolimont, WA, 15 pp.

Bennelongia (2015) Assessment of Troglofauna at OB32 East. Report 2015/234, Bennelongia Pty Ltd, Jolimont, 25 pp.

Bennelongia (2022) Western Ridge Targeted Troglofauna Surveys: 2021 and 2022. Report prepared for BHP Western Australian Iron Ore. Report 557, Bennelongia Pty Ltd, Jolimont, WA, 15pp.

Edgecombe, G. D., Giribet, G., & Wheeler, W. C. (2002). Phylogeny of Henicopidae (Chilopoda: Lithobiomorpha): a combined analysis of morphology and five molecular loci. *Systematic Entomology* 27, 31-64.

EPA (2016) Technical Guidance - Sampling methods for subterranean fauna. Environmental Protection Authority, Perth, WA, 37 pp.

EPA (2021) Technical Guidelines – Subterranean fauna surveys for environmental impact assessment. Environmental Protection Authority, Perth.

Geller, J., Meyer, C., Parker, M., and Hawk, H. (2013) Redesign of PCR primers for mitochondrial cytochrome c oxidase subunit I for marine invertebrates and application in all-taxa biotic surveys. *Molecular Ecology Resources* 13, 851-861.

Gibert, J., and Deharveng, L. (2002) Subterranean ecosystems: a truncated functional biodiversity. BioScience 52, 473-481.

Guzik, M. T., Austin, A. D., Cooper, S. J. B., Harvey, M. S., Humphreys, W. F., Bradford, T., Eberhard, S. M., King, R. A., Leys, R., Muirhead, K. A., & Tomlinson, M. (2010). Is the Australian subterranean fauna uniquely diverse? *Invertebrate Systematics* 24, 407-418.

Halse, S.A. (2018). Subterranean fauna of the arid zone. In: H Lambers (Ed.), On the ecology of Australia's arid zone. Springer Nature, Cham, Switzerland, 388 pp.

Halse, S. A., & Pearson, G. B. (2014). Troglofauna in the vadose zone: comparison of scraping and trapping results and sampling adequacy. *Subterranean Biology* 13, 17-34.

Harms, D., Curran, M. K., Kessler, R., McRae, J. M., Finston, T. L., & Halse, S. A. (2018). Species delineation in complex subterranean environments: a case study on short-tailed whipscorpions (Schizomida: Hubbardiidae). *Biological Journal of the Linnaean Society* 125, 355-367.

Harvey, M.S. (2002) Short-range endemism amongst the Australian fauna: some examples from Non-marine environments. *Invertebrate Systematics* 16, 555-570.

Harvey, M. S., Berry, O., Edward, K. L., & Humphreys, G. (2008). Molecular and morphological systematics of hypogean schizomids (Schizomida:Hubbardiidae) in semiarid Australia. *Invertebrate Systematics 22*, 167-194.

Knott, B., Storey, A.W., and Tang, D. (2009) Yanchep Cave streams and East Gnangara (Lexia) - Egerton Spring & Edgecombe Spring: invertebrate monitoring. The University of Western Australia, School of Animal Biology, 73 pp.

Martin, D.McB. (2021) Brockman Iron Formation (P_-HAb-cib): Geological Survey of Western Australia, WA Geology Online, Explanatory Notes Extract.

McKenzie, N.L., Van Leeuwen, S., Pinder, A.M. (2009) A Pilbara Biodiversity Survey of the Pilbara Region of Western Australia, 2002-2007. *Records of the Western Australian Museum*, *Supplement* ***78***, 3-89.

Moulds, T.A. (2007) Subterranean fauna of the Eneabba, Jurien and South Hill River (Nambung) karst areas, Western Australia. Subterranean Ecology, Greenwood, WA.

Ponder, W.F., and Colgan, D.J. (2002) What makes a narrow-range taxon? Insights from Australian freshwater snails. *Invertebrate Systematics* 16, 571-582.

Qiagen, A. (2006) DNeasy© blood and tissue handbook. Qiagen AG, Hombrechtikon, Switzerland

Scheller, U. (2010). Pauropods (Myriapoda: Pauropoda) from Western Australia, with descriptions of a new family, a new genus and three new species. *Records of the Western Australian Museum* 26, 1-10.

Scheller, U. (2013). Pauropoda (Myriapoda) in Australia, with descriptions of new species from Western Australia. *Records of the Western Australian Museum Supplement* 82, 1-133.

Tang, D., and Knott, B. (2009) Freshwater cyclopoids and harpacticoids (Crustacea: Copepoda) from the Gnangara Mound region of Western Australia. *Zootaxa* 2029: 1-70.

Trendall, A.F. (1965) Progress report on the Brockman Iron Formation in the Wittenoom-Yampire area. In Annual report for the year 1964: Geological Survey of Western Australia, Perth, pp. 55–64.

Tyler, I.M. (1994) Geology of the Newman 1:100,000 Sheet: Geological Survey of Western Australia. Department of Minerals and Energy, Perth, Western Australia, 11 pp.

Appendix 1: Troglofauna Species Collected in the Survey

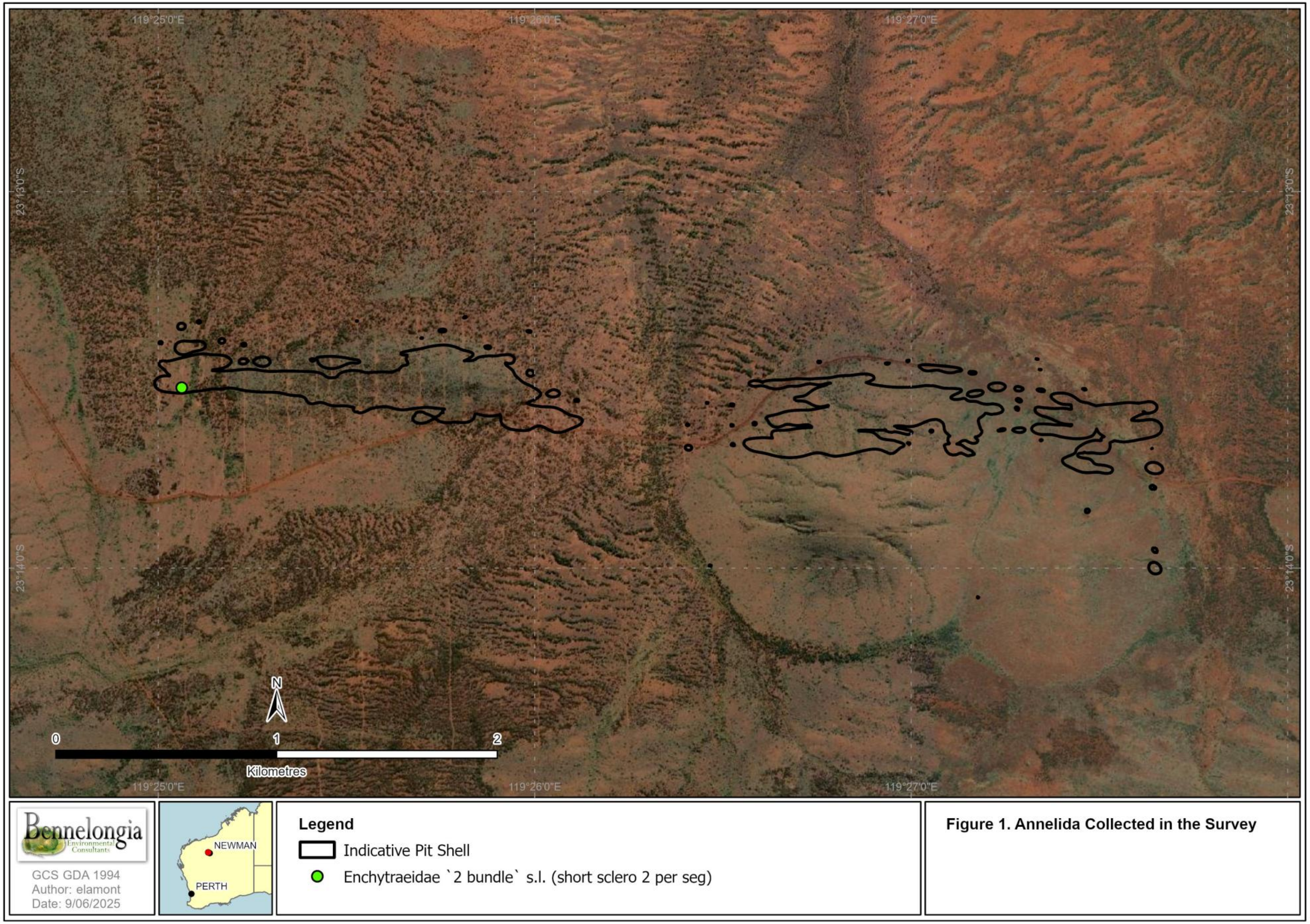
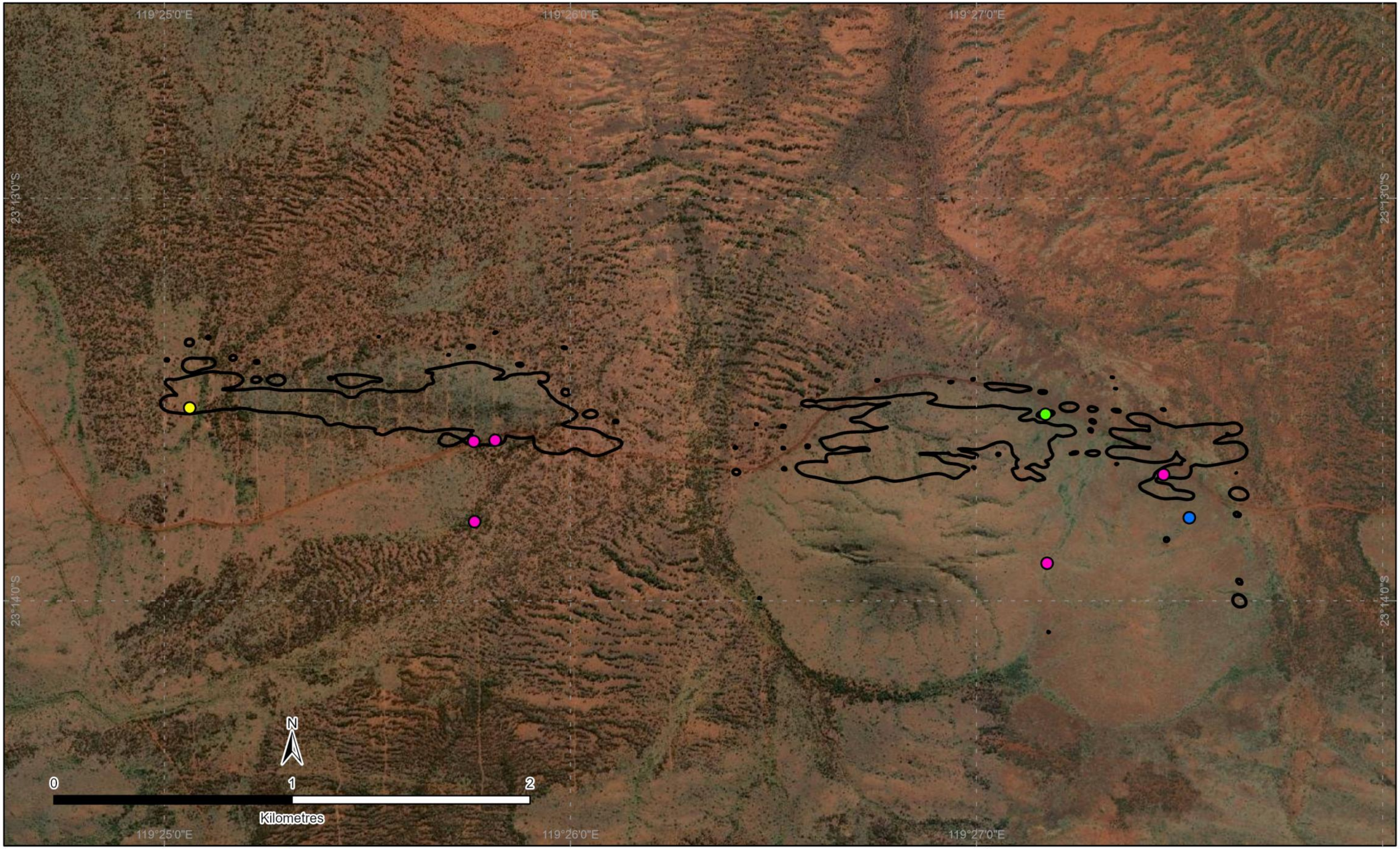


Figure 1. Annelida Collected in the Survey



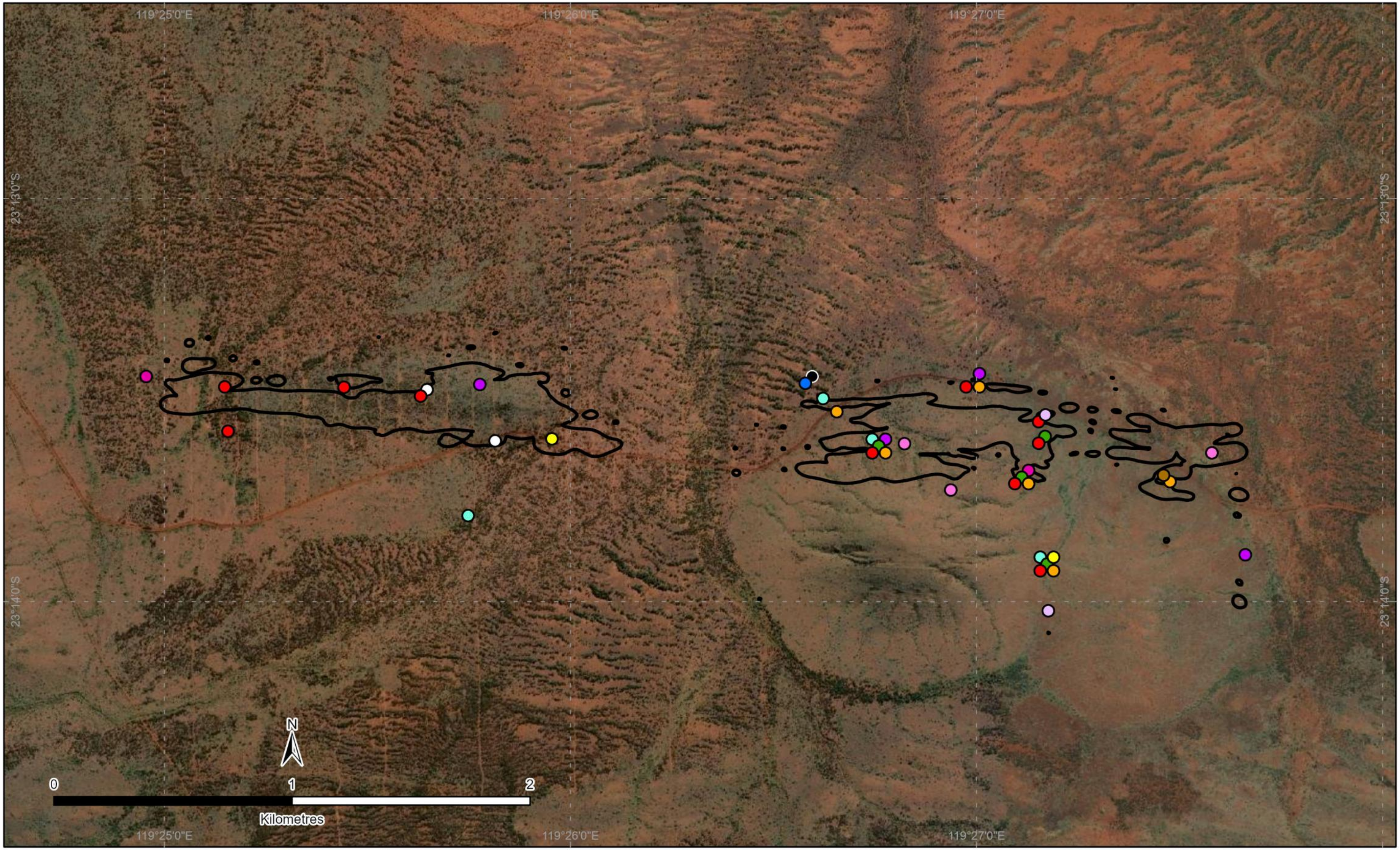
Bennelongia Environmental Consultants

GCS GDA 1994
Author: elamont
Date: 12/06/2025

Legend

- Indicative Pit Shell
- *Draculoides* `SCH055`
- *Draculoides* sp.
- Palpigradi sp.
- *Tyrannochthonius* `BPS604`

Figure 2. Arachnida Collected in the Survey



Bennelongia Environmental Consultants

GCS GDA 1994
Author: elamont
Date: 12/06/2025

Legend

- Indicative Pit Shell
- Allopnyxia sp. B01
- Cixiidae sp. B02
- Dodecastyla sp.
- Gregorydytes ophthalmianus
- Japygidae `BDP154` (DPL002)
- Japygidae `BDP246`(DBP165 grp)
- Japygidae sp.
- Meenoplidae sp. WAM-PHAC001/H-HEM003
- Nocticola quartermainei s.l.
- Nocticola sp.
- Phaconeura sp.
- Rodwayia sp.
- Trinemura `BZY120`
- Trinemura sp.

Figure 3. Hexapoda Collected in the Survey

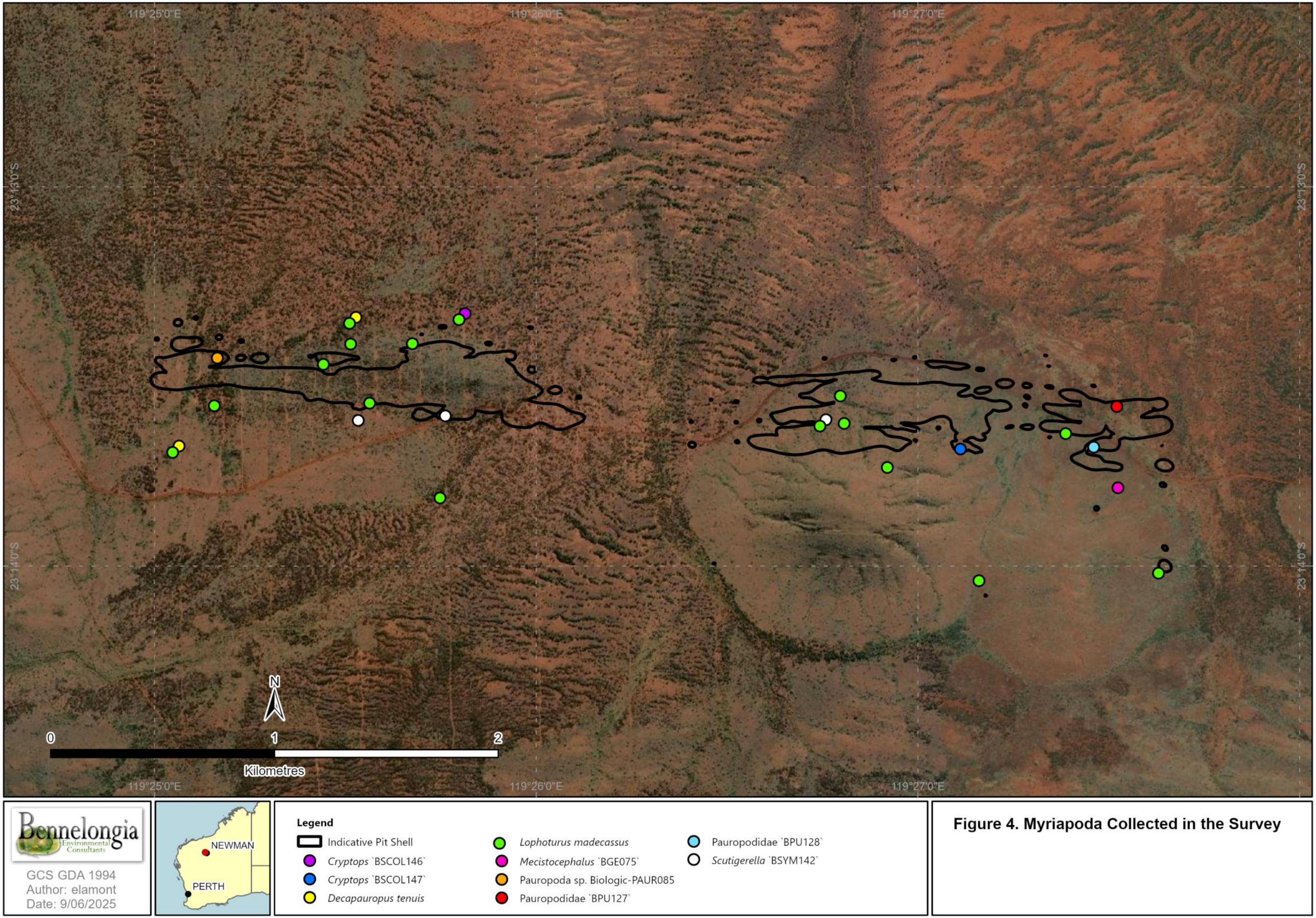


Figure 4. Myriapoda Collected in the Survey

Appendix 2: Drill Holes Sampled for Troglofauna

Fieldcode	Latitude	Longitude	Sub-Sample	SWL (mbgl)	EOH (mbgl)	Trap Depth (mbgl)	Collection Date	Notes
Round 1								
HR0071	-23.23323	119.441102	Scrape		4		6 Feb 24	
HR0071	-23.23323	119.441102	Trap 1		4	4	22 April 24	
HR0107	-23.23178	119.452894	Scrape	33			7 Feb 24	
HR0107	-23.23178	119.452894	Trap 1	33		9	22 April 24	
HR0107	-23.23178	119.452894	Trap 2	33		22	22 April 24	
HR0297	-23.231673	119.460752	Scrape		9		7 Feb 24	
HR0297	-23.231673	119.460752	Trap 1		9	5	22 April 24	
HR0297	-23.231673	119.460752	Trap 2		9	9	22 April 24	
HR0081	-23.230142	119.433254	Scrape	37			6 Feb 24	
HR0081	-23.230142	119.433254	Trap 1	37		10	22 April 24	
HR0081	-23.230142	119.433254	Trap 2	37		28	22 April 24	
HR0086	-23.230058	119.429404	Scrape		6		6 Feb 24	Hole blocked at 6m by root matter
HR0086	-23.230058	119.429404	Trap 1		6	6	22 April 24	Hole blocked at 6m by root matter
HR0201	-23.229899	119.458737	Scrape		7		7 Feb 24	
HR0201	-23.229899	119.458737	Trap 1		7	6	22 April 24	
HR0118	-23.228719	119.448947	Scrape		6		6 Feb 24	
HR0118	-23.228719	119.448947	Trap 1		6	6	22 April 24	
HR0191	-23.228185	119.451858	Scrape	42			7 Feb 24	
HR0191	-23.228185	119.451858	Trap 1	42		12	22 April 24	
HR0191	-23.228185	119.451858	Trap 2	42		26	22 April 24	
HR0327	-23.228102	119.457672	Scrape		20		7 Feb 24	

Fieldcode	Latitude	Longitude	Sub-Sample	SWL (mbgl)	EOH (mbgl)	Trap Depth (mbgl)	Collection Date	Notes
HR0327	-23.228102	119.457672	Trap 1		20	8	22 April 24	
HR0327	-23.228102	119.457672	Trap 2		20	18	22 April 24	
HR0110	-23.228064	119.417743	Scrape		10		5 Feb 24	
HR0110	-23.228064	119.417743	Trap 1		10	5	22 April 24	
HR0110	-23.228064	119.417743	Trap 2		10	7	22 April 24	
HR0130	-23.22693	119.425567	Scrape		10		5 Feb 24	
HR0130	-23.22693	119.425567	Trap 1		10	6	22 April 24	
HR0130	-23.22693	119.425567	Trap 2		10	8	22 April 24	
HR0175	-23.226903	119.445989	Scrape		8		6 Feb 24	
HR0175	-23.226903	119.445989	Trap 1		8	6	22 April 24	
HR0175	-23.226903	119.445989	Trap 2		8	8	22 April 24	
HR0211	-23.226879	119.432297	Scrape		31		6 Feb 24	
HR0211	-23.226879	119.432297	Trap 1		31	10	22 April 24	
HR0211	-23.226879	119.432297	Trap 2		31	24	22 April 24	
HR0262	-23.226693	119.430237	Scrape	38			6 Feb 24	
HR0262	-23.226693	119.430237	Trap 1	38		15	22 April 24	
HR0262	-23.226693	119.430237	Trap 2	38		20	22 April 24	
HR0122	-23.226027	119.448935	Scrape		22		6 Feb 24	
HR0122	-23.226027	119.448935	Trap 1		22	10	22 April 24	
HR0122	-23.226027	119.448935	Trap 2		22	16	22 April 24	
HR0075	-23.226019	119.440968	Scrape	32			6 Feb 24	
HR0075	-23.226019	119.440968	Trap 1	32		11	22 April 24	
HR0075	-23.226019	119.440968	Trap 2	32		20	22 April 24	

Fieldcode	Latitude	Longitude	Sub-Sample	SWL (mbgl)	EOH (mbgl)	Trap Depth (mbgl)	Collection Date	Notes
HR0319	-23.2259	119.42823	Scrape		5		6 Feb 24	
HR0319	-23.2259	119.42823	Trap 1		5	5	22 April 24	
HR0286	-23.225768	119.436186	Scrape		5		6 Feb 24	
HR0286	-23.225768	119.436186	Trap 1		5	5	22 April 24	
HR0141	-23.225619	119.452834	Scrape	33			7 Feb 24	
HR0141	-23.225619	119.452834	Trap 1	33		18	22 April 24	
HR0141	-23.225619	119.452834	Trap 2	33		26	22 April 24	
HR0124	-23.225349	119.417715	Scrape	39			5 Feb 24	
HR0124	-23.225349	119.417715	Trap 1	39		10	22 April 24	
HR0124	-23.225349	119.417715	Trap 2	39		30	22 April 24	
HR0181	-23.225205	119.443987	Scrape		5		6 Feb 24	
HR0181	-23.225205	119.443987	Trap 1		5	5	22 April 24	
HR0249	-23.225109	119.415676	Scrape	38			5 Feb 24	
HR0249	-23.225109	119.415676	Trap 1	38		10	22 April 24	
HR0249	-23.225109	119.415676	Trap 2	38		28	22 April 24	
HR0089	-23.224624	119.429338	Scrape		13		6 Feb 24	
HR0089	-23.224624	119.429338	Trap 1		13	6	22 April 24	
HR0089	-23.224624	119.429338	Trap 2		13	11	22 April 24	
HR0278	-23.224307	119.442979	Scrape		16		6 Feb 24	
HR0278	-23.224307	119.442979	Trap 1		16	9	22 April 24	
HR0278	-23.224307	119.442979	Trap 2		16	14	22 April 24	
HR0257	-23.2242	119.424326	Scrape	35			5 Feb 24	
HR0257	-23.2242	119.424326	Trap 1	35		4	22 April 24	

Fieldcode	Latitude	Longitude	Sub-Sample	SWL (mbgl)	EOH (mbgl)	Trap Depth (mbgl)	Collection Date	Notes
HR0171	-23.224176	119.449844	Scrape		23		7 Feb 24	
HR0171	-23.224176	119.449844	Trap 1		23	10	22 April 24	
HR0171	-23.224176	119.449844	Trap 2		23	20	22 April 24	
HR0129	-23.22331	119.425505	Scrape	35			5 Feb 24	
HR0129	-23.22331	119.425505	Trap 1	35		5	22 April 24	
HR0096	-23.222399	119.425463	Scrape	35			5 Feb 24	
HR0096	-23.222399	119.425463	Trap 1	35		15	22 April 24	
HR0096	-23.222399	119.425463	Trap 2	35		25	22 April 24	
HR0316	-23.222235	119.430232	Scrape		13		6 Feb 24	
HR0316	-23.222235	119.430232	Trap 1		13	6	22 April 24	
HR0316	-23.222235	119.430232	Trap 2		13	10	22 April 24	
Round 2								
HR0105	-23.234631	119.452949	Scrape		41		23 July 24	
HR0105	-23.234631	119.452949	Trap 1		41	5	24 Sep 24	
HR0105	-23.234631	119.452949	Trap 2		41	10	24 Sep 24	
HR0106	-23.23371	119.452947	Scrape		18		23 July 24	
HR0106	-23.23371	119.452947	Trap 1		18	5	24 Sep 24	
HR0106	-23.23371	119.452947	Trap 2		18	15	24 Sep 24	
HR0143	-23.233378	119.46078	Scrape		38		24 July 24	
HR0143	-23.233378	119.46078	Trap 1		38	15	24 Sep 24	
HR0143	-23.233378	119.46078	Trap 2		38	25	24 Sep 24	
HR0071	-23.23323	119.441102	Scrape		4		24 July 24	
HR0071	-23.23323	119.441102	Trap 1		4	4	24 Sep 24	

Fieldcode	Latitude	Longitude	Sub-Sample	SWL (mbgl)	EOH (mbgl)	Trap Depth (mbgl)	Collection Date	Notes
HR0107	-23.23178	119.452894	Scrape	33			23 July 24	
HR0107	-23.23178	119.452894	Trap 1	33		10	24 Sep 24	
HR0107	-23.23178	119.452894	Trap 2	33		20	24 Sep 24	
HR0297	-23.231673	119.460752	Scrape		11		24 July 24	
HR0297	-23.231673	119.460752	Trap 1		11	5	24 Sep 24	
HR0297	-23.231673	119.460752	Trap 2		11	10	24 Sep 24	
HR0081	-23.230142	119.433254	Scrape	37			23 July 24	
HR0081	-23.230142	119.433254	Trap 1	37		15	24 Sep 24	
HR0081	-23.230142	119.433254	Trap 2	37		25	24 Sep 24	
HR0064	-23.230081	119.452878	Scrape		36		23 July 24	
HR0064	-23.230081	119.452878	Trap 1		36	15	24 Sep 24	
HR0064	-23.230081	119.452878	Trap 2		36	30	24 Sep 24	
HR0086	-23.230058	119.429404	Scrape		8		23 July 24	
HR0086	-23.230058	119.429404	Trap 1		8	5	24 Sep 24	
HR0201	-23.229899	119.458737	Scrape		7		23 July 24	
HR0201	-23.229899	119.458737	Trap 1		7	5	24 Sep 24	
HR0118	-23.228719	119.448947	Scrape		8		25 July 24	
HR0118	-23.228719	119.448947	Trap 1		8	4	24 Sep 24	
HR0118	-23.228719	119.448947	Trap 2		8	8	24 Sep 24	
HR0191	-23.228185	119.451858	Scrape	49			23 July 24	
HR0191	-23.228185	119.451858	Trap 1	49		15	24 Sep 24	
HR0191	-23.228185	119.451858	Trap 2	49		30	24 Sep 24	
HR0327	-23.228102	119.457672	Scrape		26		23 July 24	

Fieldcode	Latitude	Longitude	Sub-Sample	SWL (mbgl)	EOH (mbgl)	Trap Depth (mbgl)	Collection Date	Notes
HR0327	-23.228102	119.457672	Trap 1		26	15	24 Sep 24	
HR0327	-23.228102	119.457672	Trap 2		26	25	24 Sep 24	
HR0110	-23.228064	119.417743	Scrape		10		22 July 24	
HR0110	-23.228064	119.417743	Trap 1		10	10	25 Sep 24	
HR0062	-23.227085	119.460704	Scrape		36		23 July 24	
HR0062	-23.227085	119.460704	Trap 1		36	15	24 Sep 24	
HR0062	-23.227085	119.460704	Trap 2		36	30	24 Sep 24	
HR0130	-23.22693	119.425567	Scrape		10		22 July 24	
HR0130	-23.22693	119.425567	Trap 1		10	5	25 Sep 24	
HR0130	-23.22693	119.425567	Trap 2		10	10	25 Sep 24	
HR0175	-23.226903	119.445989	Scrape		8		23 July 24	
HR0175	-23.226903	119.445989	Trap 1		8	5	24 Sep 24	
HR0211	-23.226879	119.432297	Scrape		31		23 July 24	
HR0211	-23.226879	119.432297	Trap 1		31	10	24 Sep 24	
HR0211	-23.226879	119.432297	Trap 2		31	20	24 Sep 24	
HR0206	-23.226828	119.449962	Scrape		21		23 July 24	
HR0206	-23.226828	119.449962	Trap 1		21	5	24 Sep 24	
HR0206	-23.226828	119.449962	Trap 2		21	15	24 Sep 24	
HR0016	-23.226797	119.447052	Scrape	50			23 July 24	
HR0016	-23.226797	119.447052	Trap 1	50		10	24 Sep 24	
HR0016	-23.226797	119.447052	Trap 2	50		25	24 Sep 24	
HR0101	-23.226771	119.444967	Trap 1		38	12	24 Sep 24	
HR0101	-23.226771	119.444967	Trap 2		38	30	24 Sep 24	

Fieldcode	Latitude	Longitude	Sub-Sample	SWL (mbgl)	EOH (mbgl)	Trap Depth (mbgl)	Collection Date	Notes
HR0262	-23.226693	119.430237	Scrape	41			22 July 24	
HR0262	-23.226693	119.430237	Trap 1	41		15	24 Sep 24	
HR0262	-23.226693	119.430237	Trap 2	41		30	24 Sep 24	
HR0066	-23.226506	119.452823	Scrape		41		23 July 24	
HR0066	-23.226506	119.452823	Trap 1		41	10	24 Sep 24	
HR0066	-23.226506	119.452823	Trap 2		41	25	24 Sep 24	
HR0051	-23.226011	119.41956	Scrape	48			25 July 24	
HR0051	-23.226011	119.41956	Trap 1	48		4	25 Sep 24	
HR0051	-23.226011	119.41956	Trap 2	48		8	25 Sep 24	
HR0319	-23.2259	119.42823	Scrape		5		24 July 24	
HR0319	-23.2259	119.42823	Trap 1		5	5	24 Sep 24	
HR0220	-23.225892	119.426328	Scrape		6		22 July 24	
HR0220	-23.225892	119.426328	Trap 1		6	6	24 Sep 24	
HR0286	-23.225768	119.436186	Scrape		7		23 July 24	
HR0286	-23.225768	119.436186	Trap 1		7	5	24 Sep 24	
HR0141	-23.225619	119.452834	Scrape	33			23 July 24	
HR0141	-23.225619	119.452834	Trap 1	33		10	24 Sep 24	
HR0141	-23.225619	119.452834	Trap 2	33		20	24 Sep 24	
HR0017	-23.225581	119.446882	Scrape		4		23 July 24	
HR0017	-23.225581	119.446882	Trap 1		4	4	24 Sep 24	
HR0124	-23.225349	119.417715	Scrape	46			22 July 24	
HR0124	-23.225349	119.417715	Trap 1	46		15	25 Sep 24	
HR0181	-23.225205	119.443987	Scrape		5		23 July 24	

Fieldcode	Latitude	Longitude	Sub-Sample	SWL (mbgl)	EOH (mbgl)	Trap Depth (mbgl)	Collection Date	Notes
HR0181	-23.225205	119.443987	Trap 1		5	5	24 Sep 24	
HR0249	-23.225109	119.415676	Scrape	49			22 July 24	
HR0249	-23.225109	119.415676	Trap 1	49		10	25 Sep 24	
HR0249	-23.225109	119.415676	Trap 2	49		25	25 Sep 24	
HR0089	-23.224624	119.429338	Scrape		13		22 July 24	
HR0089	-23.224624	119.429338	Trap 1		13	6	24 Sep 24	
HR0089	-23.224624	119.429338	Trap 2		13	13	24 Sep 24	
HR0278	-23.224307	119.442979	Scrape		16		23 July 24	
HR0278	-23.224307	119.442979	Trap 1		16	5	24 Sep 24	
HR0278	-23.224307	119.442979	Trap 2		16	10	24 Sep 24	
HR0257	-23.2242	119.424326	Scrape		5		22 July 24	
HR0257	-23.2242	119.424326	Trap 1		5	5	25 Sep 24	
HR0050	-23.224186	119.419418	Scrape		26		25 July 24	
HR0050	-23.224186	119.419418	Trap 1		26	10	25 Sep 24	
HR0050	-23.224186	119.419418	Trap 2		26	20	25 Sep 24	
HR0171	-23.224176	119.449844	Scrape		23		23 July 24	
HR0171	-23.224176	119.449844	Trap 1		23	10	24 Sep 24	
HR0171	-23.224176	119.449844	Trap 2		23	20	24 Sep 24	
HR0274	-23.224123	119.454665	Scrape		11		23 July 24	
HR0274	-23.224123	119.454665	Trap 1		11	5	24 Sep 24	
HR0274	-23.224123	119.454665	Trap 2		11	10	24 Sep 24	
HR0129	-23.22331	119.425505	Scrape	40			22 July 24	
HR0129	-23.22331	119.425505	Trap 1	40		15	24 Sep 24	

Fieldcode	Latitude	Longitude	Sub-Sample	SWL (mbgl)	EOH (mbgl)	Trap Depth (mbgl)	Collection Date	Notes
HR0129	-23.22331	119.425505	Trap 2	40		25	24 Sep 24	
HR0096	-23.222399	119.425463	Scrape	38			22 July 24	
HR0096	-23.222399	119.425463	Trap 1	38		5	24 Sep 24	
HR0096	-23.222399	119.425463	Trap 2	38		10	24 Sep 24	
Round 3								
HR0002	-23.226317	119.458693	Scrape		4		30 Oct 24	
HR0016	-23.226797	119.447052	Scrape		52		30 Oct 24	
HR0016	-23.226797	119.447052	Trap 1		52	20	16 Jan 25	
HR0016	-23.226797	119.447052	Trap 2		52	40	16 Jan 25	
HR0017	-23.225581	119.446882	Scrape		4		30 Oct 24	
HR0017	-23.225581	119.446882	Trap 1		4	4	16 Jan 25	
HR0050	-23.224186	119.419418	Trap 1		26	5	16 Jan 25	
HR0050	-23.224186	119.419418	Trap 2		26	9	16 Jan 25	
HR0051	-23.226011	119.41956	Scrape		16		30 Oct 24	
HR0051	-23.226011	119.41956	Trap 1		16	7	16 Jan 25	
HR0051	-23.226011	119.41956	Trap 2		16	16	16 Jan 25	
HR0062	-23.227085	119.460704	Scrape		36		31 Oct 24	
HR0062	-23.227085	119.460704	Trap 1		36	15	16 Jan 25	
HR0062	-23.227085	119.460704	Trap 2		36	30	16 Jan 25	
HR0064	-23.230081	119.452878	Scrape		36		30 Oct 24	
HR0064	-23.230081	119.452878	Trap 1		36	10	16 Jan 25	
HR0064	-23.230081	119.452878	Trap 2		36	20	16 Jan 25	
HR0066	-23.226506	119.452823	Scrape		41		31 Oct 24	

Fieldcode	Latitude	Longitude	Sub-Sample	SWL (mbgl)	EOH (mbgl)	Trap Depth (mbgl)	Collection Date	Notes
HR0066	-23.226506	119.452823	Trap 1		41	15	16 Jan 25	
HR0066	-23.226506	119.452823	Trap 2		41	30	16 Jan 25	
HR0071	-23.23323	119.441102	Scrape		4		30 Oct 24	
HR0071	-23.23323	119.441102	Trap 1		4	4	16 Jan 25	
HR0081	-23.230142	119.433254	Scrape	40			30 Oct 24	
HR0081	-23.230142	119.433254	Trap 1	40		30	16 Jan 25	
HR0086	-23.230058	119.429404	Scrape		7		30 Oct 24	
HR0086	-23.230058	119.429404	Trap 1		7	6	16 Jan 25	
HR0089	-23.224624	119.429338	Scrape		7		30 Oct 24	
HR0089	-23.224624	119.429338	Trap 1		7	7	16 Jan 25	
HR0096	-23.222399	119.4255	Scrape		7		28 Oct 24	
HR0096	-23.222399	119.4255	Trap 1		7	5	16 Jan 25	
HR0110	-23.228064	119.417743	Scrape		10		30 Oct 24	
HR0110	-23.228064	119.417743	Trap 1		10	10	16 Jan 25	
HR0124	-23.225349	119.417715	Scrape	46.57	66		28 Oct 24	
HR0124	-23.225349	119.417715	Trap 1	46.57	66	15	16 Jan 25	
HR0124	-23.225349	119.417715	Trap 2	46.57	66	30	16 Jan 25	
HR0129	-23.22331	119.425505	Scrape		20		28 Oct 24	
HR0129	-23.22331	119.425505	Trap 1		20	10	16 Jan 25	
HR0129	-23.22331	119.425505	Trap 2		20	20	16 Jan 25	
HR0130	-23.22693	119.425567	Scrape		12		30 Oct 24	
HR0141	-23.225619	119.452834	Scrape	39			31 Oct 24	
HR0141	-23.225619	119.452834	Trap 1	39		10	16 Jan 25	

Fieldcode	Latitude	Longitude	Sub-Sample	SWL (mbgl)	EOH (mbgl)	Trap Depth (mbgl)	Collection Date	Notes
HR0141	-23.225619	119.452834	Trap 2	39		20	16 Jan 25	
HR0143	-23.233378	119.46078	Scrape		38		31 Oct 24	
HR0143	-23.233378	119.46078	Trap 1		38	10	16 Jan 25	
HR0143	-23.233378	119.46078	Trap 2		38	20	16 Jan 25	
HR0171	-23.224176	119.449844	Scrape		23		30 Oct 24	
HR0171	-23.224176	119.449844	Trap 1		23	10	16 Jan 25	
HR0171	-23.224176	119.449844	Trap 2		23	20	16 Jan 25	
HR0175	-23.226903	119.445989	Scrape		9		30 Oct 24	
HR0175	-23.226903	119.445989	Trap 1		9	7	16 Jan 25	
HR0181	-23.225205	119.443987	Scrape		4		30 Oct 24	
HR0181	-23.225205	119.443987	Trap 1		4	4	16 Jan 25	
HR0191	-23.228185	119.451858	Scrape	48.89	50		29 Oct 24	
HR0191	-23.228185	119.451858	Trap 1	48.89	50	10	16 Jan 25	
HR0191	-23.228185	119.451858	Trap 2	48.89	50	20	16 Jan 25	
HR0201	-23.229899	119.458737	Scrape		7		30 Oct 24	
HR0201	-23.229899	119.458737	Trap 1		7	5	16 Jan 25	
HR0206	-23.226828	119.449962	Scrape		21		30 Oct 24	
HR0206	-23.226828	119.449962	Trap 1		21	7	16 Jan 25	
HR0206	-23.226828	119.449962	Trap 2		21	15	16 Jan 25	
HR0220	-23.225892	119.426328	Scrape		9		30 Oct 24	
HR0220	-23.225892	119.426328	Trap 1		9	9	16 Jan 25	
HR0249	-23.225109	119.415676	Scrape	47.65	96		28 Oct 24	
HR0249	-23.225109	119.415676	Trap 1	47.65	96	7	16 Jan 25	

Fieldcode	Latitude	Longitude	Sub-Sample	SWL (mbgl)	EOH (mbgl)	Trap Depth (mbgl)	Collection Date	Notes
HR0249	-23.225109	119.415676	Trap 2	47.65	96	15	16 Jan 25	
HR0257	-23.2242	119.424326	Scrape	48			30 Oct 24	
HR0257	-23.2242	119.424326	Trap 1	48		15	16 Jan 25	
HR0257	-23.2242	119.424326	Trap 2	48		30	16 Jan 25	
HR0262	-23.226693	119.430237	Scrape	42.85	67		29 Oct 24	
HR0262	-23.226693	119.430237	Trap 1	42.85	67	15	16 Jan 25	
HR0262	-23.226693	119.430237	Trap 2	42.85	67	30	16 Jan 25	
HR0274	-23.224123	119.454665	Scrape		11		30 Oct 24	
HR0274	-23.224123	119.454665	Trap 1		11	10	16 Jan 25	
HR0278	-23.224307	119.442979	Scrape		18		30 Oct 24	
HR0278	-23.224307	119.442979	Trap 1		18	8	16 Jan 25	
HR0278	-23.224307	119.442979	Trap 2		18	15	16 Jan 25	
HR0286	-23.225768	119.436186	Scrape		9		30 Oct 24	
HR0286	-23.225768	119.436186	Trap 1		9	5	16 Jan 25	
HR0297	-23.231673	119.460752	Scrape		11		31 Oct 24	
HR0297	-23.231673	119.460752	Trap 1		11	5	16 Jan 25	
HR0297	-23.231673	119.460752	Trap 2		11	10	16 Jan 25	
HR0319	-23.2259	119.42823	Scrape		5		30 Oct 24	
HR0319	-23.2259	119.42823	Trap 1		5	5	16 Jan 25	
HR0327	-23.228102	119.457672	Scrape		26		30 Oct 24	
HR0327	-23.228102	119.457672	Trap 1		26	10	16 Jan 25	
HR0327	-23.228102	119.457672	Trap 2		26	20	16 Jan 25	

Appendix 3: Results of molecular analyses for troglofauna collected in the project area

Collection Date	Bore Code	Final Identification	Identification Before DNA	Comments
5 Feb 2024	HR0124	Palpigradi sp.	Palpigradi sp.	Failed during DNA sequencing.
22 April 2024	HR0278	*Gregorydytes ophthalmianus*	*Gregorydytes ophthalmianus*	No species level match was found with this sequence, with the closest match being 9.6% distant to *Anillinus* sp. 1, stored in the GenBank database. No sequence is present for *G. opthalmianus* in either database, therefore ID is maintained, and this sequence becomes reference sequence.
25 July 2024	HR0248	Japygidae `BDP246` (DBP165 grp)	Japygidae sp.	This sequence is 6% distant from Japygidae `BDP246` (DBP165 grp) in the Bennelongia database and 1.94% distant from Japigydiae sp. BDP165 group in the GenBank database. Due to the inconsistencies and contention around Japygidae BDI165 groups, Japygidae `BDP246` (DBP165 grp) is maintained until BDI165 groups are resolved.
24 Sep 2024	HR0278	Japygidae sp. BDP154 (DPL002)	Japygidae sp.	This sequence is 1.1% distant from Japygidae sp. BDP154 (DPL002) in both the Bennelongia and GenBank databases. These samples represent the same genetic species.
23 July 2024	HR0175	Scutigerella `BSYM142`	*Hanseniella* sp.	No species level match was found for this sequence, with the closest match being 16% distant from Scutigerellidae sp. Biologic-SYMP007 in the GenBank database. Closest *Hansienella* species was 16.4% distant from *Hanseniella*_B19. Closer to *Scutigerella* than *Hansienella* therefore genus is changed and novel species name is assigned.
23 July 2024	HR0191	Japygidae `BDP246` (DBP165 grp)	Japygidae sp.	This sequence is 6% distant from Japygidae `BDP246` (DBP165 grp) in the Bennelongia database and 1.94% distant from Japigydiae sp. BDP165 group in the GenBank database. Due to the inconsistencies and contention around Japygidae BDI165 groups, Japygidae `BDP246` (DBP165 grp) is maintained until BDI165 groups are resolved.
24 Sep 2024	HR0191	Japygidae `BDP246` (DBP165 grp)	Japygidae sp.	This sequence is 6% distant from Japygidae `BDP246` (DBP165 grp) in the Bennelongia database and 1.94% distant from Japigydiae sp. BDP165 group in the GenBank database. Due to

Collection Date	Bore Code	Final Identification	Identification Before DNA	Comments
				the inconsistencies and contention around Japygidae BDI165 groups, Japygidae `BDP246` (DBP165 grp) is maintained until BDI165 groups are resolved.
24 Sep 2024	HR0201	*Tyrannochthonius* `BPS604`	*Tyrannochthonius aridus*	No species level match was found for this sequence, with the closest match being 18.6% distant from *Tyrannochthonius* `BPS537` in the Bennelongia database. It did not match the sequence for *T. aridus*. Therefore, a novel species name was assigned
29 Oct 2024	HR0243	*Scutigerella* `BSYM142`	*Scutigerella* `BSYM142`	No species level match was found for this sequence, with the closest match being 16% distant from Scutigerellidae sp. Biologic-SYMP007 in the GenBank database. Closest *Hansienella* species was 16.4% distant from Hanseniella_B19. Closer to *Scutigerella* than *Hansienella* therefore genus is changed and novel species name is assigned.
29 Oct 2024	HR0243	*Draculoides* sp. SCH055	Draculoides `BSC121`	This sequence is 0.91% distant from *Draculoides* sp. SCH055 in the GenBank Database.
6 Feb 2024	HR0262	*Draculoides* sp. SCH055	Draculoides sp. indet.	This sequence is 0.91% distant from *Draculoides* sp. SCH055 in the GenBank Database.
7 Feb 2024	HR0107	*Draculoides* sp. SCH055	Draculoides sp. indet.	This sequence is 0.91% distant from *Draculoides* sp. SCH055 in the GenBank Database.
7 Feb 2024	HR0141	*Draculoides* sp. SCH055	Draculoides sp. indet.	This sequence is 0.91% distant from *Draculoides* sp. SCH055 in the GenBank Database.
7 Feb 2024	HR0141	Draculoides sp. indet.	Draculoides sp. indet.	Failed before sequencing.
7 Feb 2024	HR0327	*Draculoides* sp. SCH055	Draculoides sp. indet.	This sequence is 0.91% distant from *Draculoides* sp. SCH055 in the GenBank Database.
30 Oct 2024	HR0086	*Draculoides* sp. SCH055	Draculoides sp. indet.	This sequence is 0.91% distant from *Draculoides* sp. SCH055 in the GenBank Database.
30 Oct 2024	HR0002	Pauropodidae `BPU127`	Pauropodidae `BPU127`	No species level match was found for this sequence, with the closest match being 14.4% distant from Pauropodidae `BPU125` in the Bennelongia Database, and 21.94% distant from

Collection Date	Bore Code	Final Identification	Identification Before DNA	Comments
				Pauropodidae `BPU076` in the GenBank database. No close hits, so Pauropodidae `BPU127` is retained as a species code.
30 Oct 2024	HR0327	Pauropodidae `BPU128`	Pauropodidae `BPU128`	No species level match was found for this sequence, with the closest match being 26.3% distant from Pauropodidae `BPU125` in the Bennelongia Database, and 21.55% distant from Pauropodidae `PAUR007` in the GenBank database. No close hits, so Pauropodidae `BPU128` is retained as a species code.
30 Oct 2024	HR0050	Pauropoda sp. Biologic-PAUR085	Pauropodidae `BPU129`	This sequence is 0% distant from Pauropoda sp. Biologic-PAUR085 in the GenBank database.